

XVI. *Notes on South African insects.* By J. P. MANSEL WEALE, B.A.

[Read April 3rd, 1878.]

*On some insects found on Acacia horrida, and protected by resemblances to various parts of that tree. Foliage imitators.*—The foliage of *Acacia horrida* is bipinnate; at the base of each leaf on the foot-stalk is a somewhat ovate gland, which yields a gummy secretion. The young leaves which appear after rain, irrespective of the season of the year, have their pinnae closely appressed; they are brilliant golden-green in colour, with a tinge of orange-crimson, and shine very brightly from the exudation of a kind of gummy varnish, which becomes hard towards noon in hot weather, and, I believe, protects them from the excessive evaporation they would otherwise suffer. The thorny stipules in this stage are coloured nearly the same as the foliage, but with age, in dry districts, become white, assuming different shades of colour, and also different sizes. The leaves, when full grown, have a brilliant gloss. Towards night they droop and close their leaves, as also in wet weather during the day. From the broken nature of the foliage, and the open situations in which these trees are generally found, it is evident that under a clear sky and a brilliant sun the effects of chequered direct light with that reflected from the foliage must dazzle the eye. These extremely white lights on the foliage of most South African shrubs are painfully conspicuous to the painter.

The brilliant silvery ornaments which render so many of our South African insects objects of peculiar beauty, and which would apparently make them extremely conspicuous, under these circumstances admirably disguise them.

As instances of foliage imitators among Rhopalocerous and Heterocerous larvæ, *Acridiidæ*, *Locustidæ*, *Mantidæ*, *Hemiptera* and *Arachnida*, may be mentioned the following species:—*Cænobasis amena*, Feld., a small moth allied to *Limacodes*, *Gyanisa Isis*, mentioned in

Darwin's "Descent of Man" (Vol. II., p. 132), *Phaneroptera zebrata* (*Locustidæ*), a species of *Locustidæ* belonging to the genus *Saga* (?), the larvæ of *Lycæna otacilia* (Trim.), and *L. amarah*, the larvæ of *Harpax spinocula*, and other *Mantidæ*, *Epeïra vigilans*, Blackm., &c.

The eggs of *Gynanisa Isis*, and of several other large Saturnian moths, are usually hard, bright, and easily seen, and are attached to conspicuous parts of the outer branches of the tree. I am inclined to think that they are not subject to many enemies. In the first stage the young larvæ are sienna-brown in colour, and harmonize in tint with the young twigs on which they may be found for some time clustered. Their colour is nearly the same as that of the larva of a species of *Cucullia*, which closely resembles the bark. Later the larva becomes green-coloured with white markings, and small protuberances tufted with darkish setæ. When it has acquired a considerable size it assumes those splendid silver and gold-tipped spines which make it such a conspicuous object on removal from the tree. The larva of *Saturnia Apollonia*, though smaller in size, closely resembles that of *G. Isis*, but the dark markings, being replaced by crimson, add to its beauty. In its earlier stages the small setæ on the dorsal protuberances produced a painful irritation on the skin, a peculiarity apparently not possessed by *G. Isis*. The caterpillars of this last species I believe to be eaten by several birds, and I know that they were formerly much relished by the Fingo tribe, to whom they are known as "Y-goïnya," or, as they are called by the colonists, "Kaffir oysters." I may mention that my son declared that they were very good when roasted over the fire.

The females and larvæ of some Orthopterous insects, as also the males in a less degree, are adorned in a similar manner with white enamel-like markings. In a species of *Pneumora* I have generally found the young on *Schotia speciosa*, the foliage of which affords even a better refuge to these green, red and silvery insects, than does that of the *Acacia*. Several species of an Orthopterous insect belonging to the genus *Saga* (?) have the abdominal segments laterally marked with silvery white in loops, the insects sometimes being rufous, or of different shades of green. It is said to feed on other *Orthoptera*, especially *Truxalids*, to which it bears a general resemblance, but

although of a fierce disposition this statement requires confirmation.

A silvery coloration of the underside effectually protects at least three native butterflies when at rest, viz., *Nymphalis Jahlusa*, *Iolus Silas* and *I. Sidus*. These butterflies are extremely rapid on the wing and fly generally in the brightest sunshine, but their flight is usually short.

The best representations of protective resemblance to the young foliage are offered by the larvæ of *Cænobasis amæna*, Feld. (a small moth allied to *Limacodes*), and of *Lycæna amarah* and *L. otacilia*. The first of these is a most lovely object; the tufted tubercles with which it is adorned, and the loop-like markings on the sides, disguise it effectually. From observing one on the still dewy tree in the early morning, I am inclined to think that the enamelled spots of blue and white, which shine on its back, are advantageous in disguising it while feeding. The imago of this and of another species are colour protected, while the pupa case fastened to the branch resembles an excrescence of the bark.

The larva and mature form of a *Harpax* allied to *H. spinocula*, two spiders and two small caterpillars also have a general resemblance to the young foliage.

The Orthopterous insect *Phaneroptera zebrata* deserves instead the specific name of "*pinnatifoliata*," for in every stage it is most difficult of detection, and though very abundant I have heard it singing towards dusk on a branch close to my face and yet found it extremely difficult to see the insect.

An undetermined Hemipterous insect has a general resemblance in colour to the foliage, and when viewed obliquely, its colour and markings cause it to strikingly resemble the scarred petioles and petiolules of the leaves. Various small geometric caterpillars which feed on the foliage are in like manner disguised. The larva of a moth, probably a species of *Psyche*, strips the leaflets to form cases: in addition to the leafy protection the case is so tough that I imagine few could open it. A small caterpillar, referred to in the "Descent of Mau" (Vol. I., p. 416), packs the flowers and leaflets on its back by means of short setæ which secrete a glutinous substance. This caterpillar, when placed in a box with leaves and flowers, showed a preference for coloured objects by detaching and fixing on its back pieces of pink paper from the lining of

the box. I believe there are more than one species which do this, as I found one on a *Rhus* with the flowers of that shrub similarly packed.

*Imitators of thorns, excrescences, dead foliage, stems, bark, &c.*—The larvæ of two moths, one of which is allied to *Pyralis*, form cases which exactly resemble the thorns of the *Acacia* and of *Celastrus buxifolius*. Sometimes a leaflet is attached to the extremity of the thorn. Those larvæ found on the *Acacia* are very much attacked by Ichneumon-flies, in spite of the deceitful appearance of their case. Indeed, I have found that most protected larvæ are thus persecuted by parasites. The moth of this species is commonly found in the daytime nestled among some of the accumulations of dead leaves abundant on this tree, and which are often made use of by various insects for nests. The *Acacia* is liable to so many diseases and distortions from fungoid growths or boring insects that considerable collections of *débris* are found on its branches, and these are taken advantage of by various insects more or less darkly-coloured, particularly *Hemiptera* and spiders. Among the most curious of these is *Pephricus paradoxus*, which closely resembles some of these bundles of dried pinnæ. *Pyrops marginata*, West., when mature is commonly found on the branches, but its true food plant is *Rhynchosia pinnata*.

A species of *Mantis* (*Popa spurca*, Stål), found on various shrubs, is of different shades of brown, and in its different stages of growth, especially when immature, resembles dead stalks.

A *Phasmid* (*Palophus Haworthii*, G. R. Gray), found near Cradock, like many of these insects, resembles a dead stick. Several spiders, such as *Epeira vigilans*, and a species of *Cerostus*, resemble the dead fragments of bark and broken stems. *Pycnacantha hystrix*, Thor., a spider found on grass near a thorn tree, bears a wonderful resemblance to a dead thistle head, which deception is aided by the motionless position of the *Arachnid* when captured, and is such as to deceive the most careful observer.

Among the insects commonly found are several which wonderfully resemble the droppings of birds, and their coloration, as might have been anticipated, is extremely variable. The pupæ of *Pieris agathina* and *P. poppea*, the larvæ of which feed on species of *Loranthus*, have this resemblance, while a small *Mantis* (*Oxyphilus annu-*

*latus*, Serville = *Capensis*, Saussure), an undescribed species of *Thomisus*, an *Epeïrid*, a species of *Zilla*, and a small moth (*Acontia formosa*), extremely variable in its colour, are always found in conspicuous positions, and by the attitudes they assume are difficult to distinguish from the real droppings. The little *Mantis* in particular, though extremely active on being disturbed when frightened or on the watch for prey, doubles all its limbs together and bends back its abdomen in such a manner as to appear quite inanimate.

*Floral imitators.*—None of these are peculiar to the *Acacia*, unless it be a species of Longicorn beetle, and I am inclined to think that this is not protected by its yellow-coloured bands. *Harpax spinocula*, and another species of *Thomisus*, extremely variable in colour, are found on the flowers of this and many other yellow blossoms of different orders, such as *Compositæ*, *Liliacæ*, &c. The flower-packing larva I have already mentioned. I may also state that the blossoms are often frequented by small Lamellicorn beetles having very long hind legs which project from the blossoms. Similar insects are also found on many *Compositæ*, and in the same situation may be found spiders which thrust up their forelegs in such a manner as to be hardly distinguishable from the beetles. From the frequency with which I have found these insects associated together I can hardly doubt that the attitude assumed by the spider is imitative.

*Mimicry of ants by spiders of the genus Salticus.*—It is well known that among spiders of the genus *Salticus* there is a group (*Attus*, Walck.), of which the resemblance to ants is wonderfully close. As I am not aware that any explanation of this curious similarity has been given, I now make known my observations on some of the species. An ant of the genus *Crematogaster*, and another belonging to *Camponotus*, are each of them imitated by spiders, and in both cases, but especially in the first, I have noticed the spiders mingling with the ants on apparently friendly, or at least neutral, terms. The small black *Crematogaster* is imitated by a spider of the same size and appearance, being smooth and shiny. It was very curious to notice the spider curving its long forelegs after the manner of the ant's antennæ, turning up its abdomen exactly like the stinging *Crematogaster*, and occasionally halting, and then again speeding along the branches. In fact, so close

in appearance and habits are the two creatures, that I have frequently lost sight of the spider, or captured an ant in mistake.

The *Salticus* which imitates the *Camponotus* is larger and hairy, like the ant. Both these ants are fond of sweet secretions, and visit the glands of the *Acacia*, and also various kinds of Homopterous insects, the *Crematogaster* being particularly attentive to different species of *Akeres*, and it was on a diseased orange tree that I first noticed the friendly terms on which the spider lived with the ants. A great many small flies and other insects frequent trees thus diseased, and in such numbers that I have little doubt they may seriously diminish the food of the ants.

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The *Orthoptera* referred to in this paper have been identified by Mr. J. Wood-Mason. An explanation of the mimicry of ants by spiders has been suggested by Mr. Meldola. (See Proc. Ent. Soc., April 3rd, 1878, p. xiv.)